

**202.04 BASIS OF PAYMENT.**

Payment will be made at the Contract Unit Price for the following:

| <b>Pay Items</b>                                 | <b>Pay Unit</b>                        |
|--|--|
| Removal of Structures and Obstructions           | Lump Sum                               |
| Removal of Structure                             | Each, Lump Sum                         |
| Removal of Box Culvert                           | Each, Lump Sum                         |
| Removal of Concrete                              | Lump Sum, Square Yard, Cubic Yard, Ton |
| Removal of _____ Surfacing                       | Square Yard, Cubic Yard, Ton           |
| Removal & Salvage of _____ Surfacing             | Square Yard, Cubic Yard, Ton           |
| Removal & Salvage Culverts,<br>All Types & Sizes | Linear Foot                            |
| Removal of Curb & Gutter                         | Linear Foot                            |
| Saw Concrete                                     | Linear Foot                            |
| Saw Bituminous Surfacing                         | Linear Foot                            |
| Removal of Manholes                              | Each                                   |
| Removal of Inlets                                | Each                                   |
| Removal of _____                                 | (Any of Above)                         |

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

**Exclusions.** When the Bid Schedule does not contain an estimated quantity or a Lump Sum item for "Removal of Structures and Obstructions," and the structure or obstruction is shown on the Plans, the work will not be paid for directly but will be included in other Contract Items. If the structure or obstruction is not shown on the Plans and removal is directed by the Engineer, payment will be made according to Section 104.03 D.

## **SECTION 203 EXCAVATION AND EMBANKMENT**

**203.01 DESCRIPTION.**

This work consists of excavation, haul, placement and compaction of embankment, and disposal, if necessary, of material encountered within the limits of work necessary for construction of the roadway. Excavation in this Section will be classified as "Common Excavation," "Rock Excavation," "Muck Excavation," "Shale Excavation," or "Borrow" as described below.

- A. **Common Excavation.** Common Excavation consists of all excavation not otherwise classified. If encountered, coal will be measured and paid for as Common Excavation and shall be deposited outside the construction limits at designated locations, or at locations acceptable to the Engineer.

Types of excavation according to compaction control methods shall be as follows:

| Type   | Section  |
|--|----------|
| 1. Common Excavation with Compaction Control, Type A | 203.02 G |
| 2. Common Excavation with Compaction Control, Type B | 203.02 H |
| 3. Common Excavation with Type C Embankment          | 203.02 I |

- B. **Rock Excavation.** Rock Excavation consists of excavating hard solid rock in ledges and bedded deposits which is so hard or firmly cemented that it must be blasted before it can be excavated and removed; or that heavy duty dozer-mounted rippers or dozer blades must be used to break the material into chunks. Material that breaks or shatters into pieces of less than one cubic foot in size during breaking operations (excluding blasting) will be classified as shale.

Rock excavation includes all boulders and other detached rock having a volume of 1/2 cubic yard or more.

If no bid item is provided for Rock Excavation, and rock is encountered which must be blasted or ripped as described above, the material will be paid for as shown in the Price Schedule PS-1.

- C. **Shale Excavation.** Shale excavation includes the excavating of shale material consisting of laminated, fissile, sedimentary material composed principally of fine grained particles. The Contractor must demonstrate to the Engineer that the material is shale and cannot be removed by conventional scrapers and dozers and must be ripped by use of heavy-duty rippers of a type normally rear-mounted on dozers or similar equipment. If the material can be ripped using a motor grader equipped with ripper/scarifying teeth, it will be paid for as Common Excavation.

When shale is a bid item, Section 104.04 will not apply. If no bid item is provided, and shale is encountered which has to be ripped before removal, as described above, the material will be paid for as shown in the Price Schedule PS-1.

- D. **Muck Excavation.** Muck Excavation consists of the removal and disposal of deposits of saturated or unsaturated mixtures of soils and organic matter unsuitable for use as embankment material; and cannot be removed by use of conventional scrapers and dozers, but must be removed by equipment such as draglines, shovels, excavators which operate outside the area being excavated.

If no bid item is provided for Muck Excavation, and muck is encountered which requires removal as described above, the material will be paid for as shown in the Price Schedule PS-1.

- E. **Borrow.** Borrow consists of excavation, haul, placement, and compaction of embankment material obtained from locations outside the Right of Way. The borrow areas may be either Department-optional or Contractor-furnished, as shown in the Contract or as approved by the Engineer.

- F. **Unclassified Excavation.** Unclassified excavation consists of the removal and disposal of all materials of whatever character encountered in the work.

## 203.02 CONSTRUCTION REQUIREMENTS.

- A. **General.** The excavation and embankments shall be finished to smooth and uniform surfaces. No excess material shall be disposed of without permission of the

Engineer. Excavation operations shall be conducted without disturbing material outside the slope limits. Before beginning excavation, grading, and embankment operations, all necessary clearing and grubbing in the area shall have been performed according to Section 201.

Borrow material should not be placed until all roadway excavation has been placed in the embankment. If more borrow is placed than is required and causes a waste of excavation, the quantity of waste will be deducted from the volume measured in the borrow area. If more embankment is placed than is required, the excess embankment quantity will be deducted from the volume of borrow or excavation measured for payment.

1. **Rock Subcut.** Material classified as rock shall be excavated to a minimum depth of 6 inches and a maximum depth of 12 inches below subgrade within the limits of the roadbed. The excavation shall be backfilled with material designated on the Plans or approved by the Engineer. Undrained pockets shall not be left in the rock surface. Rock removed in excess of 12 inches below subgrade will not be measured or paid for.

Rock excavation backfill in excess of 12 inches below the subgrade will be at the Contractor's expense.

2. **Roadway Obliteration.** Limits of obliteration of old roadways will be shown on the Plans. Obliteration includes removal of roadway surface material, structures, and appurtenances, filling in of all ditches, rough grading, placing of topsoil, and seeding. The original ground contour shall be restored to present an appearance of natural rounded slopes.
3. **Historical Preservation.** When the remains of prehistoric dwelling sites or artifacts of historical or archaeological significance are encountered within the Right of Way, easement areas, or within Department optioned borrow areas, the Contractor shall immediately cease operations at that location and shall meet the provisions of Section 107.04 A.

Before removal of topsoil or other material from a Contractor furnished borrow area, the Contractor shall meet the provisions of Section 107.04 B and initiate appropriate action at least 14 days before disturbing the borrow area.

4. **Unsuitable Material.** Unsuitable material encountered in the subgrade shall be removed to the depth directed and disposed of under Section 203.02 D. Construction operations shall be conducted so necessary measurements can be taken before replacing unsuitable material with satisfactory backfill.
5. **Second Handling.** When excavation which requires more than one handling before final placement due to circumstances beyond the Contractor's control, the second handling will be paid as agreed upon before the work by:
  - a. A negotiated price.
  - b. Extra Work according to Section 104.03 D.

- B. **Salvaging, Stockpiling, and Spreading Topsoil.** Topsoil shall be removed from all excavation and embankment areas, and stockpiled on the Right of Way at

designated or acceptable locations outside the grading limits. Additional areas outside the Right of Way required to stockpile topsoil shall be obtained by and at the Contractor's expense. Topsoil shall be removed to its full depth, but not to exceed 6 inches. The equipment and methods shall be adjusted to avoid the removal of subsoil or other unsuitable material. Hauling of topsoil shall not exceed the Plan haul limits. All stockpiled topsoil shall be spread evenly over the entire area of the new roadway except the roadbed.

- C. **Subcut, Scarify, and Recompact Roadbed.** In areas designated to be subcut, the roadbed shall be excavated and removed below the proposed grade line within the horizontal and vertical limits shown on the Plans. The next one foot in depth shall be scarified and recompact.

Subcut sections shall be backfilled and compacted with material approved by the Engineer. Subcut will be paid as Common Excavation material.

In cut sections not designated to be subcut, the roadbed shall be scarified and recompact to a depth of one foot. All scarifying and recompact shall be included in the price bid for Common Excavation.

All material, whether scarified or backfilled, shall be recompact with the same type of moisture and density controls as specified for the embankment construction.

- D. **Disposal of Surplus and Unsuitable Material.** Excavated materials classed as waste or unsuitable shall be disposed of at sites selected by the Contractor and acceptable to the Engineer. All rocks and boulders shall be buried under at least one foot of earth. All suitable surplus material shall be used to uniformly widen embankments and flatten slopes within the Right of Way. The Contractor shall obtain and file with the Department, a copy of the written permission from the Landowner for disposal sites outside of the Right of Way. Waste or unsuitable material shall not be placed in wetlands. Payment will be made at negotiated prices according to Section 104.03 D.

E. **Borrow.**

1. **General.** Borrow material shall not be excavated beyond the dimensions and elevations established, or before staking and cross sectioning the site.

Topsoil, as shown in the Contract Documents, shall be removed and stockpiled before excavation of borrow material. The Contractor shall provide at least 2 working days notice to the Engineer to complete the necessary preliminary cross sectioning before removal of topsoil. An additional one working day notice shall be given before excavating borrow so topsoil measurements can be completed.

After excavation is complete, the borrow area shall be reshaped to insure accurate final cross sectioning of the borrow area and provide adequate drainage. Excavated slopes shall not be steeper than 8:1 except where blending into existing steeper slopes. Cartways shall be obliterated, reshaped, and all disturbed areas reseeded to meet the condition of the adjacent ground surfaces. The costs of obliterating, scarifying, reshaping, and reseeded of the cartways shall be incidental to the price bid for "Borrow."

Work shall be scheduled in all borrow areas to allow any utility company to relocate, adjust, or remove their facilities.

Borrow material shall not be removed within 5 feet of any buried facility, within 10 feet of any utility pole, or within 25 feet of any utility structure until the utility has been relocated, removed, or adjusted. The slopes around utilities shall not be steeper than 3:1.

After relocation, removal, or adjustment of the utility, all remaining material shall be removed to match the final adjacent elevations. The Contractor's operations shall be coordinated with the utility companies.

The Department will be responsible for utilities relocations and costs of relocations in Department-optioned borrow areas. The Contractor shall be responsible for any utility adjustment work in Contractor-furnished borrow areas.

Fencing removed to facilitate borrow operations shall be replaced to its original condition to the satisfaction of the landowner. The Contractor shall be responsible for confinement of livestock when fencing is removed or altered.

2. **Department-Optioned Borrow.** The Department may acquire an option and may assign the right to take materials from the sources described in the proposal. The Contractor shall notify the landowner in writing that the Contractor is exercising the Department's option to purchase materials under the terms and conditions provided in the option and any other terms and conditions which might be negotiated and agreed to between the Contractor and the landowner. A copy of the written notification to exercise the Department's option, and any other agreement negotiated between the Contractor and the landowner regarding use of Department optioned pits, must be provided to the Engineer approximately 10 days before moving into a Department-optioned borrow area. The written notification to the landowner shall inform the property owner or agent of the removal plan and use of the cartway.

All Department-optioned borrow area data listed in the Proposal is preliminary borrow area information. Contractors are responsible for checking all listed borrow area information before bidding.

Information issued for Department-optioned borrow areas is for use by all Bidders on an equal competitive basis.

The Contractor shall verify from County records and furnish to the Engineer in writing the name(s) of the legal owner(s) of the borrow area during the time the borrow material was removed. The names of any other parties having a legal interest in the property shall be included in the written statement.

If the borrow area is not used after notifying the Department and landowner of the expected borrow area entry, the Contractor is liable for crop damage. If the borrow area is used, the Department is liable for crop damage. Crop damage will be paid according to the predetermined amount stated in the Proposal Form.

The removal, stockpiling, and spreading of topsoil shall be as specified in Section 203.02 B. Seeding shall be according to Section 708.02.

After the borrow area has been restored to a satisfactory condition, the Contractor shall obtain a release from the landowner or the landowner's authorized

agent. The Contractor shall make the royalty payment to the landowner, including other parties with legal interest in the property, and shall obtain a receipt of payment. Cost of royalties shall be included in the price bid for borrow. A copy of the release and receipt of payment shall be furnished to the Department.

After the Contractor has removed the minimum quantity of borrow estimated in the borrow option, the Contractor shall pay the landowner and any other parties with legal interest in the property 80% of the minimum payment within 30 days after the Department has made payment to the Contractor. The balance of the royalty payment shall be paid within 30 days after the Department supplies the Contractor with final quantities. Should the work be performed in more than one calendar year, payment for material removed from the optioned area during a calendar year shall become due on December 31 of that year. If a different payment arrangement is negotiated between the Contractor and the landowner, a copy of the agreement shall be filed with the Department.

If a material shortage or other problems occur in the Department-optioned area, and the Contractor is directed to furnish borrow from an alternate site, payment for topsoil and seeding will be made on the basis shown for the Department-optioned area. The Contractor will be reimbursed for any costs or hauls in excess of what would be incurred in the Department-optioned area. Measurement for added haul will be according to Section 203.03 E.

3. **Contractor-Furnished Borrow.** Unless the Department-optioned borrow areas listed in the Proposal Form are mandatory, the Contractor may obtain the borrow from another source. If no Department-optioned borrow is listed in the Proposal Form, the Contractor shall obtain a suitable borrow source. The Engineer will determine if the material from another source is suitable for the specified use.

The Contractor shall make arrangements for obtaining suitable borrow and shall bear all costs of obtaining, opening, and restoring the site.

In either circumstance, the Contractor's costs shall include but shall not be restricted to, royalty payments, removal and replacement of topsoil, reshaping and scarifying, obliterating cartways, crop damage, seeding, and any overhaul. After the borrow area has been restored to satisfactory condition, the Contractor shall obtain a release and receipt of payment from the landowner and furnish copies to the Department.

- F. **Embankment Construction.** Embankment construction includes preparation of areas upon which embankments are to be placed; construction of dikes inside or outside the Right of Way; placement and compaction of material in areas where unsuitable material has been removed; and placement and compaction of embankment material in holes, pits, and other depressions within the roadway area. Only approved materials shall be used in the construction of embankments and backfills.

Rocks, broken concrete, or other solid materials shall not be placed in embankment areas where piling is to be placed or driven. Rocks larger than 4 inches in its longest dimension shall not be placed in the top one foot of the finished grade.

Benching shall be required whenever embankment is placed against slopes steeper than 4:1. Benching shall be of sufficient width to permit operations of placing and compacting equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Excavated material shall be recompacted along with new embankment material, and the cost for benching and recompacting shall be incidental to the price bid for other items.

Whenever the finished subgrade lies within 3 feet of an existing compacted roadway with an aggregate or bituminous surface, the bituminous material shall be removed and the remaining road surface shall be scarified to a depth of at least 6 inches and recompacted to the specified density. The bituminous material shall be disposed of according to Section 203.02 D.

If embankment can only be placed on one side of abutments, wing walls, piers, or culvert headwalls, compaction operations shall be accomplished without placing excessive pressure against the structure. The fill adjacent to the bridge abutment shall not be placed higher than the berm elevation in front of the abutment until the superstructure is in place. When embankment is placed on both sides of a concrete wall or box-type structure, the embankment shall be brought up equally on both sides of the structure.

If the Engineer directs that material to be used in embankment be hauled beyond the average haul limit, it will be measured according to Section 203.03 E and paid as specified in the Price Schedule (PS-1).

Frozen material shall not be used in embankment construction. If frozen excavation or a blanket of snow is encountered, grading operations shall be suspended.

Roadway embankments of earth material shall be placed in horizontal layers not to exceed 12 inches (loose measurement), and shall be compacted to the specified density before the next layer is placed.

Motor graders shall be used on each lift to spread the material and to obtain uniform thickness before compacting. As the compaction of each layer progresses, continuous leveling, diskings, and manipulating shall be provided to assure uniform soil distribution, moisture, and density control. Construction equipment shall be routed uniformly over the entire surface of each layer; and, if open to traffic, the embankment shall be maintained so that the traveling public can safely traverse the work area.

When the excavated material consists predominantly of rock too large to be placed in layers of the thickness prescribed, the material may be placed in thicknesses up to the average rock size, but no thicker than 2 feet. Each layer shall be leveled and smoothed by using suitable leveling equipment and by distributing the fine fragments. The rock fill lifts shall not be constructed above an elevation of 2 feet below the finished subgrade. The balance of the embankment shall be composed of suitable earth placed according to this Section.

When a rock fill is to be placed over any structure, the structure shall first be covered and compacted with a minimum of 2 feet of earth or other approved material before placing rock fill.

- G. Construction of Embankment and Treatment of Cut Areas With Compaction Control, Type A.** All embankments and cut areas, except for rock fills, shall be constructed with moisture and density controls. The requirements of Section 203.02 F also apply to this section.

The Engineer will determine the maximum dry density and optimum moisture content using AASHTO T-99 or T-180 as shown on the Plans. Both AASHTO T-99 or T-180 may be modified according to the Department's testing procedure.

When the maximum dry density is determined using AASHTO T-99, the moisture content of the soil at the time of compaction shall be not less than 4 percentage points below, nor more than 5 percentage points above the optimum moisture content. The embankment and cut areas designated to be excavated and recompacted shall be compacted to 95% of the maximum dry density as determined by AASHTO T-99.

When the maximum dry density is determined using AASHTO T-180, the moisture content of the soil at the time of compaction shall be not less than the optimum moisture content and no more than 5 percentage points above the optimum moisture. The embankment and the cut areas designated to be excavated and recompacted shall be compacted to 85% of the maximum dry density as determined by AASHTO T-180.

If the subgrade is unstable (as evidenced by sponginess or rutting) when compacted to the required density, the soil shall be dried to obtain adequate stability. This may require drying below optimum moisture. The cost of such drying will be incidental to the price bid for Common Excavation and Borrow. The soil shall be worked so that the moisture content is uniform throughout.

Private drives, minor road approaches, and other parts of the embankment outside the roadbed shall be compacted as directed by the Engineer.

In the construction of a surcharge, no specified density is required.

- H. Construction of Embankment and Treatment of Cut Areas with Compaction Control, Type B.** Except for rock fills and the first layer of fills over swampy ground, embankment materials shall be deposited in layers not exceeding 12 inches in thickness before compaction. The requirements of Section 203.02 F also apply to this section.

Each layer shall be uniformly compacted by operating grading equipment and rollers over the entire area. Tamping rollers shall be operated over each layer until the Engineer is satisfied with the depth of penetration of the tamping feet. The compaction of each layer of embankment material shall be thorough and uniform. The tamping feet of tamping rollers shall exert a ground pressure of at least 250 psi.

If the Engineer determines that the soil is too dry to secure compaction, water shall be applied to each layer before compacting.

Embankment material that is too wet to secure compaction and stability shall be dried or allowed to dry so the desired compaction can be obtained, and worked so the moisture content is uniform throughout.



Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until the specified compaction is secured.

- I. **Construction of Type C Embankment.** Except for rock fills and the first layers of fills over swampy ground, embankment material shall be spread in horizontal layers not exceeding 8 inches in thickness (loose measurement) over the full width of the proposed embankment section. No compaction other than that obtained by passage of the construction equipment over the work is required. The construction equipment shall be routed uniformly over the entire area of each layer. The addition of water or drying of fill material is required when directed by the Engineer. The requirements of Section 203.02 F also apply to this Section.
- J. **Haul.** Haul consists of transporting excavation material from its original location to its final location in the work.
  - 1. Average haul is the average distance in stations which all excavation in excess of that deposited within the station must be hauled.
  - 2. Free-haul distance is the specified distance excavated material shall be hauled without additional compensation. The free-haul distance is defined as the average haul for the Project.
  - 3. Overhaul consists of authorized hauling in excess of the free-haul distance, if the haul is also beyond the designated balance points.

The various items of work under the general heading of Earthwork includes all haul and no allowance will be made for Overhaul, except as follows:

Whenever the quantity of Excavation within balance points or divisions is insufficient to make the required embankment, and no borrow excavation is specified to make up deficiencies, the Engineer may require the Contractor to secure additional excavation outside the balance division within the limits of the Right of Way. Such material will be measured and paid for under the pertinent classifications included in the Contract as set forth under Section 200, and all transportation and haul on such material in excess of the average haul for the Project will be classed as Overhaul.

- K. **Finishing.** Excavation and embankment work, including borrow areas, shall be finished true to grade and cross section. The backslopes and ditches shall be kept finished as construction progresses.

The Contractor shall conduct operations so the distance between the point where the old road surface is disturbed or excavation begins, to where the roadbed is finished to grade and aggregate is placed does not exceed 3 miles for each active grading operation. Provisions for the safety and convenience of the traveling public shall be made on roads kept open to traffic.

- L. **Provision for Traffic Maintenance.** Temporary stockpiles of traffic service gravel shall be placed where specified or as directed by the Engineer. These stockpiles shall be used to provide a temporary surface to aid traffic flow through construction areas during wet and muddy conditions and during other periods when construction operations are suspended. Grading operations on the existing roadbed shall not be started until the temporary traffic service gravel stockpiles are complete.

Stockpiled traffic service gravel that is not needed for traffic maintenance shall be used as follows:

1. If all the material is the same class of aggregate as specified for the base, it shall be incorporated into the final aggregate course placed on the subgrade.
2. If the material is not the same class of aggregate as specified for the base, it shall be incorporated into the subgrade as directed by the Engineer.

### 203.03 METHOD OF MEASUREMENT.

- A. **Measured Quantities.** All accepted excavation and borrow shall be measured in its original position by cross-sectioning. Volumes will be computed from the cross-section measurements by the average end area, prismatic, or other acceptable methods.

Authorized excavation of rock, shale, muck, or unsuitable material below grade shall consist of that excavation necessary to provide the designed thickness of backfill. If the plane of the designated bottom of excavation falls within a layer or stratum of rock, the rock to the bottom of the layer, not to exceed 12 inches, will be authorized excavation and measured for payment. Rock excavation more than 12 inches below grade will not be paid for unless authorized by the Engineer. The measurements will include overbreakage in rock excavation from the backslopes to an amount not to exceed 10% of the actual quantity.

When unexpected rock excavation or shale is encountered, the Contractor shall notify the Engineer. The Contractor's operations shall be conducted so the rock or shale excavation quantity can be readily measurable. If this is not done, the entire quantity of material will be paid for as Common Excavation.

Unsuitable materials, excavated and removed to obtain proper compaction in cut sections and in foundations for fill sections, will be measured for payment.

Where it is impractical to measure material by the cross section method due to the erratic location of isolated deposits, acceptable methods involving three dimensional measurements may be used.

- B. **Contract Quantity Payment.** When specified on the Plans, the quantities of excavation to be paid will be those shown in the Contract, provided the Project is constructed to the lines and grades shown on the Plans.

When disagreement exists between the Contractor and the Engineer as to the accuracy of the Plan quantities in any balance or the entire Project, either party may request that the quantities be measured. Additional original cross sections may be interpolated at points where necessary to more accurately determine the quantities.

- C. **Borrow.** Borrow will be measured and paid for by the Cubic Yard or Ton according to Section 109.01.
- D. **Water.** When payment for Water is specified, Water used will be measured according to Section 216.05.

When Water is not specified as a pay item in the Contract, Water used will be included in the other items of work.

- E. **Haul.** Authorized haul will be based on depositing the excavated material in the adjacent embankment which is the minimum possible distance. The haul distance for material obtained from the roadway and placed inside the roadway shall be measured along the centerline of the roadway. The haul distance for material moved from outside the roadway shall be measured along the shortest route determined by the Engineer.

1. **Authorized Haul.** Haul will be the product obtained by multiplying the number of units of excavation removed from its original position, by the mean distance such excavation is hauled. The distance between the center of gravity of the excavation and the center of gravity of the embankment will be the haul distance in the units specified.

$$\text{Haul} = \text{Unit of Excavation} \times \text{Mean Haul Distance}$$

2. **Average Haul.** The average haul will be determined from the mass diagram. The area of the mass diagram representing the number of cubic yard stations of haul between the balance points will be divided by the ordinate of the mass which is the yardage hauled. The resulting quotient is the average haul.

Average Haul.

$$\text{Average Haul (in Sta.)} = \frac{\text{C.Y. Sta. of Haul}}{\text{C.Y. Hauled}}$$

3. **Overhaul.** The limit of free-haul will be determined from a mass diagram by fixing on the volume curve, 2 points, one on each side of the neutral grade point, one in excavation, and the other in embankment, such that the distance between them equals the free-haul distance, and the included quantity of excavation and embankment are in balance. All materials within the free-haul limit will be eliminated from further consideration. The distance between the center of gravity of the remaining mass of excavation and the remaining mass of embankment minus the free-haul distance, will be the overhaul distance. The quantity of overhaul is the product of the overhaul distance multiplied by the number of units of material hauled in excess of the free-haul distance. Analytical methods may be used for computing overhaul in lieu of the mass diagram method described herein.

The Engineer will determine the necessity for overhaul and shall be afforded 6 hours before and after hauling operations to take the necessary cross sections and measurements to determine the volume of overhaul excavation.

Overhaul: Distances will be shown in stations.

$$\text{Overhaul Distance} = (\text{Distance between centers of gravity}) - (\text{Free Haul Distance}^*)$$

\*Free Haul Distance = Average Haul for the Project.

- F. **Obliteration.** Roadway obliteration will be measured in Linear Feet of roadway or in Cubic Yards.

- G. **Topsoil.** Topsoil from excavation, embankment, and borrow areas will be measured by the Cubic Yard. The contract quantity of topsoil may be paid if the Engineer determines that the topsoil within the construction limits has been removed and to the required depth. Any changes in the topsoil removal areas will require measurement.
- H. **Embankment.** Embankment will be measured under Section 203.03 A except the original cross sections will be taken after topsoil is removed from the embankment area. Final cross sections will be taken after the embankment is placed and before the topsoil is replaced.
- I. **Guardrail Embankment, Type C.** Guardrail Embankment, Type C will be measured as a unit at each location, complete and in place.
- J. **Urban Project Provisions.** The back side of curb and gutter is the outer limit for measurement of Common Excavation pay quantity. Where the sidewalk is adjacent to the curb and gutter, the outer limit for measurement of the Common Excavation is the outer edge of the sidewalk.

Costs for the disposal of excess excavation from the trenches of storm drains, water lines, water mains, sanitary sewers, and related items will be included in the price bid for the respective pay item.

Excess excavation and old concrete sidewalks, driveways, curb and gutter, pavement, bituminous surfacing, etc., shall be disposed of off the Right of Way at a site selected by the Contractor and acceptable to the Engineer. Disposal in wetland areas will not be allowed. The cost of disposal (and obtaining of the disposal area) will be included in the price bid for other items.

- K. **Seeding.** Seeding and Topsoil for Type C Seeding will be measured and paid for under Sections 708.02 D and 708.02 E.

#### 203.04 BASIS OF PAYMENT.

When there is no Contract item for rock or shale excavation, they will be paid for at the rate specified in the Proposal Price Schedule (PS-1).

Payment will be made at the Contract Unit Price for the following:

| <b>Pay Item</b>              | <b>Pay Unit</b>         |
|------------------------------|-------------------------|
| Common Excavation Type A     | Cubic Yard              |
| Common Excavation Type B     | Cubic Yard              |
| Common Excavation Type C     | Cubic Yard              |
| Topsoil                      | Cubic Yard              |
| Rock Excavation              | Cubic Yard              |
| Muck Excavation              | Cubic Yard              |
| Shale Excavation             | Cubic Yard              |
| Borrow                       | Cubic Yard or Ton       |
| Water                        | M.G. (1,000 Gallons)    |
| Roadway Obliteration         | Linear Feet, Cubic Yard |
| Embankment                   | Cubic Yard              |
| Guardrail Embankment, Type C | Each                    |
| Unclassified Excavation      | Cubic Yard              |

Payment will be made under:

| <b>Pay Item</b> | <b>Unit of Quantity</b> | <b>Units of Distance</b> | <b>Pay Units</b>    |
|-----------------|-------------------------|--------------------------|---------------------|
| Overhaul        | Cubic Yard              | Stations of 100 ft.      | Cubic Yard Stations |

The item of average haul will not be paid directly, as it is included in the other earth-work items.

Haul items will not be measured and paid if the material can be secured and used as shown on the Plans. If the Engineer directs hauling of materials beyond the specified or average haul limits, haul will be paid at the rate specified in the Price Schedule (PS-1).

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

## SECTION 210 STRUCTURAL EXCAVATION, STRUCTURAL FILL, AND FOUNDATION PREPARATION

### 210.01 DESCRIPTION.

Structural Excavation consists of the excavation and ordinary backfill required for installation of pipe culverts, conduits, storm drains, box culverts, and bridges.

Structural Fill shall consist of furnishing and placing foundation fill and select backfill material as shown on the Plans or as otherwise directed.

Foundation Preparation consists of site preparation for installation of a box culvert or bridge.

### 210.02 MATERIALS.

A. **Ordinary Backfill.** Material for ordinary backfill shall be approved compactible soil selected from structure or roadway excavation. Any additional material needed shall be approved material obtained from borrow excavation.

#### B. **Structural Fill.**

1. **Select Backfill.** Select backfill shall be a well-graded mixture of stone fragments or gravel, coarse sand, and fine sand, excluding scoria and shale. Maximum size and gradation shall be as specified.
2. **Foundation Fill.** Foundation fill material shall be any granular material, other than scoria or shale, with less than 35% passing the No. 200 sieve.